

**A new genus of Miltogrammatinae from Namibia
(Diptera: Sarcophagidae)**

by

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ABSTRACT

Khowaba gen. n., type-species *Khowaba atrox* sp. n., is described from Namibia, and its phylogenetic relationships are discussed.

INTRODUCTION

The Afrotropical fauna of Miltogrammatinae is large and diverse, but still poorly known, and Dear (1980) was convinced that only a minor part of the species have been described. Isolated descriptions of single species, therefore, may seem little warranted, but in the present case the outstanding appearance and large size compared to other members of the subfamily is considered sufficient justification. The species described below is the largest known member of the Miltogrammatinae.

ACKNOWLEDGEMENTS AND ABBREVIATIONS

I am grateful to H. Enghoff, Copenhagen, for providing liberal access to the collections in ZMUC. M. E. Petersen, Copenhagen, kindly read a previous draft of the manuscript.

Institutions referred to in the text have been abbreviated with the following acronyms:

NMSA = Natal Museum, Pietermaritzburg, South Africa.

ZMUC = Zoological Museum, University of Copenhagen, Denmark.

***Khowaba* gen. n.**

Etymology: From the language of the Nama people of Namibia, *khowab* = dune. The name refers to the habitat in which the type-series of the type-species was caught. Gender: Feminine.

Type-species: *Khowaba atrox* sp. n.

Generic diagnosis: Large shining black species with reduced clothing setae and microtomentum, especially in ♀. Head with fronto-orbital plate, parafacial plate and gena broad. Frontals and 2 proclinate orbital bristles weak. Ocellar bristles proclinate. Wing cell r_{4+5} with a long, straight petiole. Only posterior katapisternal bristle present. Mid tibia with 2 subequal anterodorsal bristles in distal

quarter. Claws in ♂ shorter than in ♀ and much shorter than pulvilli. ♂ cercus long, processus longi well developed, aedeagus without distinct epiphallus.

***Khowaba atrox* sp. n.**

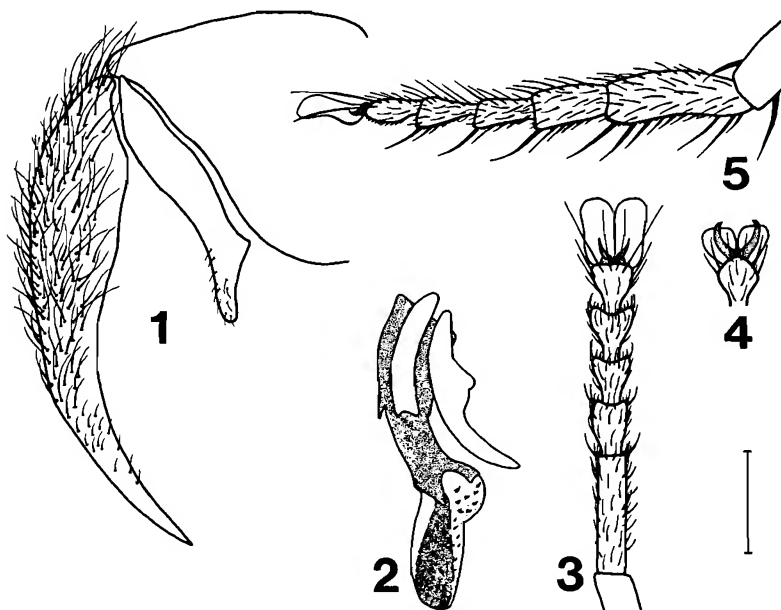
Figs 1–8

Etymology: A Greek adjective, *atrox* = cruel, harsh, horrible. The name refers to the forbidding appearance of the specimens.

Type material: Holotype ♂: NAMIBIA: Gobabeb, 31.i.1978, in dunes, O. Lomholdt (ZMUC) [pinned below conspecific female and in good condition except for crack in right eye and broken right antennal arista; terminalia dissected and stored in glycerine in separately pinned microvial provided with red holotype label and label giving data for remaining specimen]. Paratypes: 3 ♀ [one mounted above holotype], data as for holotype (1 in NMSA, 2 in ZMUC).

Description: ♂: Length 12,0 mm.

Head: Eye bare. Profrons protrudent. Parafacial plate and gena broad, genal groove well developed. Upper part of frontal vitta, fronto-orbital plate and parafacial plate grey microtomentose. Vertex, lower part of frontal vitta and gena shining black, without microtomentum. Genal groove reddish with grey microtomentum. Frons $0,18 \times$ head width, frontal vitta at level of median ocellus $2,0 \times$ width of one fronto-orbital plate but distinctly narrower anteriorly. Fronto-



Figs 1–5. *Khowaba atrox* gen. et sp. n. Details of adult morphology. 1. ♂ right cercus and surstylus, lateral view, with outline of epandrium. 2. Aedeagus and right paramere + gonopod, lateral view. 3. ♂ right fore tarsus, dorsal view. 4. ♀ right fifth tarsomere of fore tarsus, dorsal view. 5. ♂ right hind tarsus, anterior view. Scale lines: 0,4 mm (Figs 1–2); 0,8 mm (Figs 3–5).

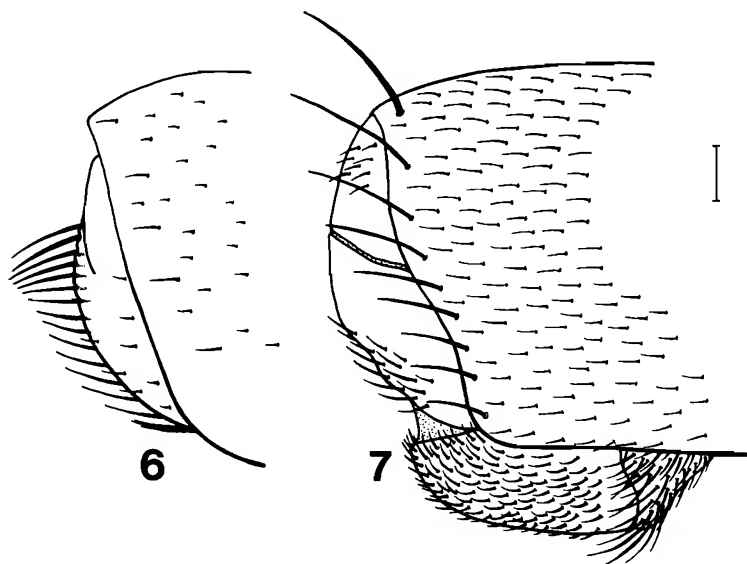
orbital plate and upper part of parafacial plate densely setose. Frontal bristles $1,5-2,0\times$ as long and as thick as adjacent setae. Ocellars proclinate, inner and outer verticals well developed, 2 proclinate orbitals. First flagellomere $2,0\times$ as long as pedicel. Arista bare, $1,6\times$ as long as first flagellomere, light brown in distal 0,6 and dark brown in proximal 0,4. Vibrissa only slightly longer than adjacent setae. Facial ridge setulose on lower half. Genal height $0,24\times$ eye height. Palpus dark brown. Proboscis short.

Thorax: Black with sparse grey microtomentum on notum. Chaetotaxy: $acr = 0 + 1$, $dc = 0 + 2$, $ia = 1$ (inner posthumeral) $+ 1$, $sa = 1 + 3$, $h = 2-4$. Katepisternum with one posterodorsal (posterior sternopleural) bristle, surface otherwise covered with setae, those on ventral part long and directed posteriorly. Anatergite without infrasquamal setulae.

Legs: Distinctly setose with bristly tarsi. Coxae, especially of fore legs, with long setae bearing wavy tips. Fore trochanter posterodorsally with tuft of long posteriorly directed setae. Fore tibia with row of pv bristles. Mid tibia with row of pv bristles in distal 0,6, several strong apical bristles, and 2 ad bristles (excluding apicals) both situated in distal 0,25. First tarsomere short, that of hind tarsus somewhat laterally compressed. Pulvilli longer than and claws much shorter than fifth tarsomere respectively.

Wing: Basicosta and veins yellow to light brown. Costal spine short but distinctly differentiated from adjacent setae. Cell r_{4+5} long, petiolate.

Abdomen: Tergites 3-5 each with anterior transverse band of grey microtomentum. Marginal bristles completely lacking on T1+2-T3, T4 with 2-3 bristly setae on lateral margins, T5 with complete row of marginal bristles.



Figs 6-7. *Khowaba atrox* gen. et sp. n. Abdominal tergite 5 and postabdomen, lateral view. 6. ♀. 7. ♂. Scale line: 0,5 mm.

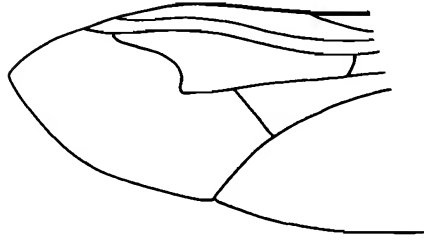


Fig. 8. Semidiagrammatical outline of distal part of left wing.

Terminalia: Protrudent, shining black. T6 almost flush with T5. T6 and syntergosternite 7+8 separated by very narrow membranous strip. Epandrium densely beset with short setae, set off from remaining terminalia and visible in lateral view without dissection. Cercus long, distal half bent in obtuse angle relative to proximal half. Surstylus with free apical part short. Processus longi typical of Miltogrammatinae, well developed and slanting laterally and posteriorly. Aedeagus with well sclerotised basiphallus. Epiphallus reduced, probably represented by small process on mid-dorsal surface of basiphallus.

♀: Length 12,0–12,5 mm.

General appearance like ♂ but with reduced chaetotaxy. Sparse setae of thorax, legs, and abdomen very short such that specimens appear to lack vestiture. Frontal bristles only distinct anteriorly. Setae of fronto-orbital plate and upper part of parafacial plate very short and situated in small spots devoid of microtomentum and therefore black. Fore and hind coxae, and posteroventral parts of katapisternum and meron with a few strong posteriorly directed bristles. Claws subequal in length to pulvilli and also to fifth tarsomere. Abdominal tergites 5–6 with strong marginal bristles.

Distribution: Namibia.

Biology: Unknown, but the specialised external morphology of the female suggests that these are able to dig through loose sand, perhaps when entering host nests for larviposition (assuming that the species is a kleptoparasite as are the majority of Miltogrammatinae). This hypothesis is supported by the reduced setosity and the strong, backwardly-directed bristles on the coxae and ventral part of the thorax. In addition, two females have the head setae apparently abraded with sand grains sticking to various parts of the head and underside of the body. The male holotype, seemingly caught *in copulo* with one of these females, has complete head chaetotaxy and is perfectly clean, indicating that the adhering sand grains are not an artefact due to collecting method.

DISCUSSION

The large size of *K. atrox* is remarkable for a member of the Miltogrammatinae and exceeds that of most Paramacronychiinae and of many Sarcophaginae. The subfamilial assignment, however, seems well corroborated by the possession of male proclinate orbital bristles, equal-sized postocular setae, a concave post-

cranium, and absence of infrascapular setulae. *K. atrox* does not possess a row of parafacial bristles close to the eye margin and the acrophallus is not situated on the ventral surface of the aedeagus, both character states probably characterising the groundplan of the clade [Paramacronychiinae + Sarcophaginae], and only the reduced epiphallus is a character state shared with the latter clade. The evidence, therefore, is in favour of an assignment to the Miltogrammatinae.

The strongly modified external morphology of *K. atrox* leaves few clues to its phylogenetic affinities. In Zumpt's (1961) key the specimens will run to *Apodacra* Macquart due to the petiolate condition of wing cell r_{4+5} . *Apodacra*, however, is a genus of small to very small, often yellowish species with a very narrow gena, a short arista, and a first flagellomere three to ten times as long as the pedicel. Apart from the wing venation, species of *Apodacra* share no derived character states with *Khowaba* that are not shared with most other genera of Miltogrammatinae, and an inclusion of *atrox* in *Apodacra* solely on the basis of wing venation is unjustified simply because many other miltogrammatine genera possess a petiolate wing cell r_{4+5} . These include the widespread genera *Taxigramma* Perris, *Hilarella* Rondani and *Sphenometopa* Townsend (in part), as well as the Palaearctic *Chrysogramma* Rohdendorf [preoccupied, no current replacement name] and *Sphecatoclea* Villeneuve. These genera, however, are very well defined by derived character states not shared with *K. atrox* (see Rohdendorf (1935), Pape (1987) and Shewell (1987)), and only *Sphecatoclea* (in the broad sense including *Parthomyia* Rohdendorf: the Parthomyiina of Rohdendorf (1967, 1975)) deserves a more elaborate discussion, as the head profile with broad fronto-orbital plate, parafacial plate and gena, and the weak frontal and orbital bristles, are reminiscent of the condition found in *Khowaba atrox*. In *Sphecatoclea*, however, the petiole of cell r_{4+5} is short and more or less recurved towards the base of the wing, and the ocellar bristles are directed laterally. Both character states are probably apomorphic with regard to the ground plan of the Miltogrammatinae and probably at the level of *Sphecatoclea* as well, and they make an inclusion of *atrox* in *Sphecatoclea* improbable. This does not, of course, exclude the possibility of a sister-group relationship between these genera, but I have found no shared character states that could corroborate this hypothesis.

The long male cercus may be considered an argument for a phylogenetic relationship to the genera *Xiphidiella* Villeneuve (southern Africa), *Eumacronychia* Townsend (New World) and *Chrysogramma* (Palaearctic). *K. atrox*, however, does not share any other character states with these genera not shared by most other miltogrammatine genera, and as *Xiphidiella*, *Eumacronychia* and *Chrysogramma* all have the abdominal tergite 6 reduced, these three genera may be more closely related to each other than to *Khowaba*.

Size, here simply measured as length, may be considered a character, and as very few Miltogrammatinae and Paramacronychiinae exceed 10 mm, the large size of *K. atrox* may be apomorphic. In the genus *Chauliooestrus* Villeneuve, recently transferred to the Miltogrammatinae (Pape 1991), *C. denudata* (Villeneuve) reaches a length of 10 mm. *Chauliooestrus leza* Pape, however, the only other known species of *Chauliooestrus*, has a size typical for the majority of Miltogrammatinae, and size alone cannot corroborate an affinity to *Chauliooestrus*. The Old

World genus *Hoplacephala* Villeneuve, here in a wide sense including at least *Synorbitomyia* Villeneuve, contains generally large miltogrammatines, united, among other character states, by two strong anterodorsal mid-tibial bristles and three katapisternal bristles standing in a triangle. [Generic definitions in the Hoplocephalina are in need of a critical revision, and several of the genera currently applied by Verves (1988) will probably be synonymised when put through a consistent character analysis.] In *Khowaba* only one katapisternal bristle is developed and although two anterodorsal mid tibial bristles are present, these are situated in the distal quarter and only the most proximal bristle can be considered homologous to one of those (probably the distal) found in *Hoplacephala*.

A reduced epiphallus is rare in the Miltogrammatinae and to my knowledge, apart from *K. atrox*, occurs only in *Amobia* Robineau-Desvoidy. The latter genus, however, is very well defined by the long row of hair-like proclinate orbital bristles and the swollen sclerite just below the basalar ampulla and in front of the mesopleural suture. Both character states are probably apomorphic at the level of *Amobia* and are not present in *Khowaba*. Even if the reduced epiphallus could be shown to be synapomorphic for these taxa, I would still recommend a generic distinction.

In conclusion, erecting a monotypic genus seems justified as *K. atrox* does not fit within any other genus of Miltogrammatinae, and only sparse and inconclusive evidence of possible sister-group relationships is available.

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